What is claimed is:

1.   A multi-channel undulation induction accelerator of charged particles, comprising:

5   an injector block;

a drive source;

output systems;

turning systems;

an induction acceleration block, which is made in the form of at least two
10   one-channel linear induction acceleration blocks (including those that are placed parallel with one to other), linked by means of the turning systems, each of which connects the output of one of the one-channel linear induction acceleration blocks with an input of another similar block, apart from those inputs which are connected with injectors, and those outputs from which accelerated particles are expressed;
15   and

wherein:

at least one of the turning systems is made in the form of a sequence of fragments of solenoid, which are joined with each other in such a manner that they form a working channel for the charged particle beam, which accomplish a 180° or
20   less angle turn.

2.   The multi-channel undulative induction accelerator of claim 2, in which:

at least one of the fragments of solenoid is made in the form of a straight solenoid.
25

3.   The multi-channel undulative induction accelerator of claim 1, in which:

at least one of the fragments of solenoid is made in the form of a section of toroid. at least one of the fragments of solenoid is made in the form of a section of toroid.
30

4.   The multi-channel undulative induction accelerator of claim 1, in which:

at least one two-pole magnet system is placed in the space between the solenoids.

assured that this condition is satisfied after each beam acceleration, turning, and merging together because the mentioned effect of the increasing electron mass. It is readily seen that the increasing the beam current (as a result of the merging together procedure) is completely compensated (with a good reserve) by increasing the electron relativistic mass.

Then after the second turning the four 100 kA beams and their merging together we obtain a single 400 kA total beam with energy 60 MeV. Therein the total accelerator length does not exceed 12-13 m. It should be mentioned that today this appears as a record of these parameters for the considered class of electron accelerators.

The invention allows using the accelerator as a commercial-type compact accelerator of charged particles, including singular and multiple parallel relativistic beams of charged particles.